

Oracle® Communications Session Monitor Installation Guide



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Oracle Communications Session Monitor Installation Guide, Release 4.1

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About This Guide

This guide provides instructions for installing Oracle Communications Session Monitor.

The Oracle Communications Session Monitor product family includes the following products:

- Operations Monitor
- Enterprise Operations Monitor
- Fraud Monitor
- Control Plane Monitor

Revision History

Date	Description
November 2017	<ul style="list-style-type: none">• Initial release
January 2018	<ul style="list-style-type: none">• Minor updates in the document
March 2018	<ul style="list-style-type: none">• Updated table in "Support Session Border Controller Versions"• Added a section in "Creating a Bootable USB"
April 2018	<ul style="list-style-type: none">• Updated table in "Supported Hardware for Oracle systems"• Updated "Installing Session Monitor Using the RPM"• Updated "Installing and Configuring DPDK with Internet"
May 2019	<ul style="list-style-type: none">• Updated "Installing Software Update"
October 2019	<ul style="list-style-type: none">• Added procedure for Secure LDAP (LDAPS) support to "Installing Session Monitor".• Updates "Installing Software Update" for accuracy.
November 2019	<ul style="list-style-type: none">• Updates link in "Installing and Configuring DPDK without Internet."

1

Overview of Session Monitor Installation

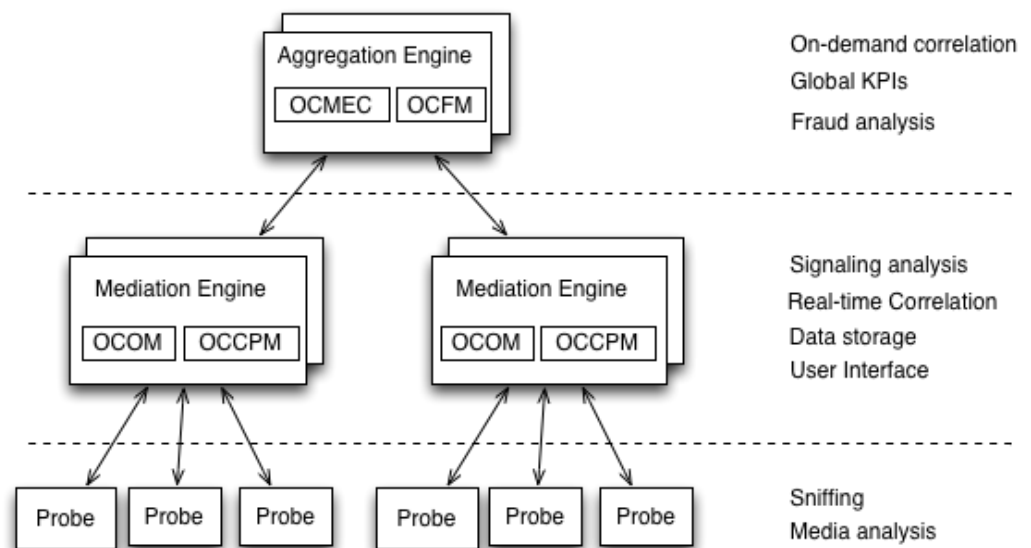
This chapter provides an overview of the Oracle Communications Session Monitor system architecture and the installation process.

Session Monitor System Architecture

The Session Monitor system works by capturing the traffic from your network, correlating it in real-time, and storing it in indexed formats so that they are available for the various reports offered by the web interface.

The Session Monitor system architecture has three layers:

- **Probe layer:** This layer is responsible for capturing the traffic from your network and performing the Media Quality analysis. The probes send meta-data for each of the signaling messages to the Mediation Engine layer and analyze the RTP streams locally, sending the results of this analysis to the Mediation Engine layer.
- **Mediation Engine (ME) layer:** This layer is responsible for understanding in real-time the traffic received, correlating it and storing it for future reference. This layer is also responsible for measuring, managing, and storing the KPIs. In the common case, there is one ME per geographical site. It is possible, however, to have the probes from multiple geographical sites sending the traffic to a single ME. It is also possible to have multiple ME installations in the same geographical site.
- **Aggregation Engine (AE) layer:** This layer is responsible for aggregating the global KPIs from all the MEs linked to it, and for the global search features. In a typical setup, there is only one AE for the whole network.



Each of the three layers supports high-availability by deploying two identical servers in active-passive or active-active modes of operation. For small setups, it is possible to run the probe

layer and the ME layer on the same physical hardware. The AE layer always requires its own hardware.

From the Session Monitor products perspective, the Operations Monitor and the Control Plane Monitor (CPM) run on the Mediation Engine (ME) while the Mediation Engine Connector (MEC) and the Fraud Monitor products run on the Aggregation Engine (AE).

About Installing Session Monitor

The installation of Session Monitor includes these steps:

1. Reviewing the system requirements and selecting the hardware that is needed.
2. Using the Session Monitor Installer to do the software installation.
3. Using the Platform Setup Application for initial system configuration.

Session Monitor System Requirements

The following sections describe the system requirements for installing Session Monitor.

Compatibility Matrix for Session Monitor

The following products can be configured with Session Monitor:

Product Name	Version
DPDK	17.05
ISR	6.0, 6.2*
Oracle Linux	7.5
SP-SBC	<ul style="list-style-type: none"> • 8.2 or lower: Works with Operations Monitor and Enterprise Operations Monitor
E-SBC	<ul style="list-style-type: none"> • 8.1 or lower: Works with Operations Monitor and Enterprise Operations Monitor

 **Note:**

The * marked version recordings at ISR should not be segmented.

Compatibility Matrix for Fraud Monitor

The following products can be configured with Fraud Monitor:

Product Name	Version
DPDK	17.05

Product Name	Version
ISR	6.0, 6.2*
Oracle Linux	7.5
SP-SBC	<ul style="list-style-type: none"> 8.2 or higher: Works with Fraud Monitor and Enterprise Telephony Fraud Monitor
E-SBC	<ul style="list-style-type: none"> 7.5 or higher: Works with Fraud Monitor and Enterprise Telephony Fraud Monitor
SDM	8.1.1

 **Note:**

The * marked version recordings at ISR should not be segmented.

 **Note:**

Fraud Monitor 4.1.0.0.0 is supported only with Session Monitor 4.1.0.0.0.

Session Monitor Connectivity

Following are Session Monitor connectivity details:

- One AE (OCOM's MEC feature): Supports up to 64 MEs
- One ME (OCOM, OCCPM): Supports up to
 - Native-Only Probes:
 - * Media+Sig ; Signalling-Only: 128
 - * Packet Inspector: 16
 - Embedded-Only Probes (SBC as a probe):
 - * < 500 parallel calls per SBC: 1k (might require some manual tweaking, unlimited open files)
 - * \geq 500 parallel calls per SBC: 128
- Mixture of SBC and native probes: 128 (individual limits still apply)
- One Probe (OCOM, OCCPM) or SBC-probe can be connected to up to:
 - Probe: 2 MEs
 - SBC: 8 MEs
- One ME (OCOM, OCCPM): Connected to up to 1 AE

Session Monitor Operating System Requirements

The following table lists the supported operating systems for running Session Monitor.

Table 1-1 Supported Operating Systems

Product	Version	Notes
Oracle Linux 7 x86-64 (64 bit)	7 or higher (with Oracle UE Kernel for Linux)	By default Oracle Linux installs Kernel 3. Oracle recommends that the latest Unbreakable Enterprise (UE) Kernel 4 for Linux is installed.

 **Note:**

- You must configure network device when installing Oracle Linux 7.
- If required, update the DPDK Drivers.
- The ISO installer ships with the latest Oracle Unbreakable Enterprise Kernel for Linux.

Session Monitor Software Requirements

The table lists the supported client browsers:

Table 1-2 Supported Client Browsers

Browser	Version
Microsoft Internet Explorer	8 or higher
Mozilla Firefox	1.5 or higher (on any operating system)
Apple Safari	Any version, including Safari for iPad
Google Chrome	Any version
Opera	9 or higher (on any operating system)

Session Monitor Supported Hardware

Session Monitor is supported on Oracle, Sun, and HP systems.

Following table lists the hardware supported for Oracle systems.

Table 1-3 Supported Hardware for Oracle systems

Component	Requirement
Server	The following servers are supported: <ul style="list-style-type: none"> • Oracle Server X7-2 • Oracle Server X6-2 • Oracle Server X6-2L • Oracle Server X5-2 • Oracle Server X5-2L

Table 1-3 (Cont.) Supported Hardware for Oracle systems

Network Adapter	The following adapters are supported: <ul style="list-style-type: none"> Oracle Quad Port 10GBase-T Adapter
-----------------	--

 **Note:**

Oracle X7-2 server supports only Session Monitor Installation using RPM installer.

The following table lists the hardware supported for Oracle systems.

Table 1-4 Supported Hardware for Oracle Sun systems

Component	Requirement
Server	The following servers are supported: <ul style="list-style-type: none"> Oracle Sun Server X4-2 Oracle Sun Server X4-2L Oracle Sun Server X3-2 Oracle Sun Server X2-4
Network Adapter	The following network adapters are supported: <ul style="list-style-type: none"> Sun Dual Port 10 GbE PCIe 2.0 Networking Card with Intel 82599 10 GbE Controller Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF

The following table lists the hardware supported for HP systems.

Table 1-5 Supported Hardware for HP Systems

Component	Requirement
Server	The following servers are supported: <ul style="list-style-type: none"> HP DL580 G9 HP DL380 G9 HP DL380p G8 HP DL580 G7
Network Adapter	The following network adapters are supported: <ul style="list-style-type: none"> HP NC365T PCIe Quad Port Gigabit Server Adapter HP NC364T PCIe Quad Port Gigabit Server Adapter HP Ethernet 1Gb 4-port 366FLR Adapter
Driver/Chipsets	The following drivers/chipsets are supported: <ul style="list-style-type: none"> e1000 (82540, 82545, 82546) e1000e (82571, 82574, 82583, ICH8..ICH10, PCH..PCH2) igb (82575, 82576, 82580, I210, I211, I350, I354, DH89xx) ixgbe (82598, 82599, X540, X550)

Session Border Controller Supported Versions

The table lists supported Session Border Controller (SBC) versions.

Table 1-6 Supported Session Border Controller Versions

Product	Versions
Enterprise Session Border Controller (E-SBC)	<ul style="list-style-type: none"> • ECZ800 • ECZ750 • ECZ740 • ECZ730
Session Border Controller (SBC)	<ul style="list-style-type: none"> • SCZ800 • SCZ750 • SCZ740 • SCZ730

Hardware Requirements for Demonstration Systems

For development or demonstrations systems with little network traffic, the following table lists the minimum requirements to install any of the Session Monitor machine types.

Table 1-7 Hardware Requirements for Demonstration Systems

Component	Minimum Requirement
Processor	2.6 GHz Intel Xeon processor, 64-bit with 8 processing threads
Memory	8 GB RAM
Disk Space	80 GB storage on a hardware RAID controller
Ports	2 Ethernet ports

Hardware Requirements for Production Systems

For production systems, Oracle recommends to complete a sizing exercise together with your Oracle Customer Support. Higher performance hardware may be required, for example, in cases with:

- High levels of monitored traffic
- High numbers of concurrent users
- High volumes of historical information

On the Mediation Engine machines, Oracle recommends using a RAID-10 array for the operating system and the database. A separate RAID-5 array is recommended for storing long-term data.

Session Monitor Virtualization Support

This section describes the software and hardware requirements for Session Monitor virtualization.

Hypervisor Support

The following hypervisors are supported:

- Oracle VM version 3.4
- VMware vSphere ESXi 5.x/6.x
- Kernel-based Virtual Machine (KVM)

Virtual Machine Requirements

The following table lists the minimum requirements for the virtual machines.

Table 1-8 Hardware Requirements for Virtual Machines

Component	Requirement
Processor	8 vCPUs
Memory	8GB RAM
Disk Space	80GB
NIC Card	1Gbps vNIC

In virtualized Mediation Engines, 50,000 concurrent calls (1 SIP leg per call) have been tested successfully.

Host Machine Requirements

The physical machine that hosts the virtual machines should contain at a minimum the hardware resources that are required to host all the virtual machines, in addition to the hardware that is required for the hypervisor.

Network Monitoring Modes

Session Monitor probes can use two modes of monitoring network mode:

- **mmpcap:** The **mmpcap** mode is based on the **libpcap** Packet Capture Library similar to **tcpdump**, using the Kernel's Packet Socket Interface. The network interface is set to promiscuous mode.
- **Data Plane Development Kit (DPDK):** DPDK is a set of data plane libraries and network interface controller drivers for fast packet processing. In this mode, the network interface is no longer accessible by the Kernel. You can find more information regarding the DPDK libraries in the website, <http://dpdk.org>.

By default, the installer enables the **mmpcap** mode which is recommended for small to medium installations (for up to 1400K pps depending on server capabilities). For higher network traffic solutions, you may choose to enable **DPDK** mode for better performance. For more information on DPDK, see [Installing and Configuring DPDK for Session Monitor](#).

Note:

The above number is only for reference. The actual decision on when to use DPDK depends on many factors. For consulting regarding this decision, Oracle recommends to complete a sizing exercise together with your Oracle sales engineer.

2

Installing Session Monitor

This chapter describes how to install Oracle Communications Session Monitor.

Before installing Session Monitor, read the following:

- [About Installing Session Monitor](#)
- [Session Monitor System Requirements](#)

Installing Session Monitor Using the RPM

This section describes installing the Session Monitor using RPM.

You have to set up the machine with Oracle Linux operating system to install Session Monitor using the RPM.

Note:

Oracle Linux installs Kernel 3 by default but it is recommended to use the latest unbreakable kernel 4. Session Monitor requires the yum groups `@base` and `@core`. Configurations are necessary for proxies and repos, if there are any. See [Configuring Proxies and Repos](#).

To install Session Monitor using an RPM:

1. Change the edition of MySQL to enterprise edition. Refer [Changing Community MySQL Edition to Enterprise Edition](#).
2. If you have a running Oracle Linux 7 (DPDK) probe with an Oracle Communications Session Monitor version prior to 3.4.0, uninstall Session Monitor by running the following command:

```
yum remove ocsn
```

3. Verify that the system hosting the mediation engine is connected to the Internet.
4. Log on to the Mediation Engine server as the root user.
5. Verify that Oracle Linux 7 is installed by running the following command:

```
cat /etc/oracle-release
```

6. Download the Session Monitor software by doing the following:
 - a. Create a temporary directory (`temp_dir`) on the system that hosts the mediation engine.
 - b. Download the software pack for your operating system from the Oracle software delivery web site.
 - c. Download the Session Monitor installation software RPM ZIP file to `temp_dir`.

- d. Unzip the Session Monitor installation software RPM ZIP file.
7. Install the Session Monitor RPM file by running the following command:

```
yum install ocsm-<rn>x86_64.rpm
```

where:

- <rn> is the current Session Monitor release number.

For example, **ocsm-4.1.0.0x86_64.rpm**

The following partitioning options are available:

- Single partition (default option)
 - Secondary partition for data storage
8. Perform the following steps to create separate partition for data (block) storage:

- a. Create the partition for data storage
- b. Run the following command to create a directory to mount the partition:

```
mkdir -pv  
/opt/oracle/ocsm/var/vsi
```

- c. Adjust **/etc/fstab** to mount the data storage partition. For example:

```
LABEL=PLD_DATA /opt/oracle/ocsm/var/vsi ext4  
defaults,nosuid,nodev,nofail 0 2
```

Result: During installation partition will be detected by product setup application and the system uses the separate partition.

9. Verify the installation by doing the following:
 - a. Navigate to **/var/log/ocsm** file.
 - b. Verify whether the following log file exists: `ocsm_installed_*.log`
10. Adjust the firewalld to access the Session Monitor applications by doing the following:

- a. Allow firewalld to access the HTTPS service (port 443) by running the following command:

```
firewall-cmd --permanent  
--zone=public --add-service=https
```

- b. (Optional) If you are planning to configure the system as a mediation engine, allow the firewalld to access the probe connection by doing the following:

- For SBC (embedded) probes:

```
firewall-cmd --permanent --zone=public --add-port=4739/tcp  
firewall-cmd --permanent --zone=public --add-port=4740/tcp
```

- For standalone probes:

```
firewall-cmd --permanent --zone=public --add-port=4741/tcp  
firewall-cmd --permanent --zone=public --add-port=4742/tcp
```

- c. Reload the configuration by running the following command:

```
firewall-cmd --reload
```

 **Note:**

If you are planning to enable additional services, see the discussion about network security in Oracle Communications Session Monitor Security Guide for a complete list of services and their respective ports.

11. Disable SELinux by running the following command:

```
setenforce 0
sed -i -e "s/^SELINUX=.*/SELINUX=disabled/" /etc/selinux/config
```

See [Session Monitor Post-Installation Tasks](#) for the post-installation configuration steps.

Configuring Proxies and Repos

You are required to configure the proxies and repos.

Configure the http proxy in `/etc/yum.conf` file and also export the same to environment by doing the following.

In `/etc.yum.conf`, add the following line:

```
proxy=<Your_Proxy>
```

where, `<your_proxy>` is the proxy server details.

Run the following command to export to the environment:

```
export http_proxy=<Your_Proxy>
export https_proxy=<Your_Proxy>
```

Run the following command to enable the required proxies in `yum.conf` file before upgrade:

```
curl -O https://yum.oracle.com/public-yum-ol7.repo
mv public-yum-ol7.repo /etc/yum.repos.d/public-yum-ol7.repo
yum-config-manager --enable ol7_latest ol7_UEKR4 ol7_developer_EPEL ol7_optional_
latest ol7_addons ol7_UEKR3 ol7_UEKR5
```

Configuring Reverse Proxy Server

 **Note:**

Configuring reverse proxy server is optional.

The Session Monitor services are available to you through a reverse proxy web server. By default, the Session Monitor comes with a bundled copy of NGINX, the configuration files located at `/opt/oracle/ocsm/etc/nginx` file. However, you may choose to use another web server, such as Apache. A sample configuration file for Apache 2.4 is located at `/opt/oracle/ocsm/etc/httpd/conf.d/pld.conf` file.

After installing Apache, run the following commands to enable Apache as a front-end web server instead of NGINX:

```
systemctl stop pld-nginx.service
systemctl disable pld-nginx.service
```



```
ln -sf /usr/lib/systemd/system/{httpd,pld-webserver}.service
cp /opt/oracle/ocsm/etc/httpd/conf.d/pld.conf /etc/httpd/conf.d/
mv /etc/httpd/conf.d/ssl.conf{,.orig}
systemctl daemon-reload
systemctl start httpd.service
systemctl enable httpd.service
```

If you choose to authenticate users at the level of the reverse proxy, you must uncomment the sections in the sample Apache configuration file which configures LDAP authentication for the `/me/` and `/mec/` routes, and modify them as appropriate for your authentication provider. Additionally, you must enable external authentication in the Mediation Engine and the Mediation Engine Controller. See the discussion on external authentication in the *Operations Monitor User's Guide*.

Configuring Apache for Authenticating with LDAP Service

Note:

The NGINX Web Server provided with Session Monitor does not support the external authentication. To enable external authorization you are required to have NGINX Web Server that provides external authentication and is optional.

The following procedure explains configuring external authentication using Apache Web Server as it is widely used.

To configure Apache in Session Monitor for authenticating with LDAP service:

1. Login to Session Monitor.
2. Click **Admin** and select **Settings**.
3. Enable the setting, **External authentication** enabled and set it to True.
4. Logout from Session Monitor.
5. (Optional) If the current web service is NGINX, change to HTTPD by performing following steps:
 - a. Run the following commands to install the Apache Web Server and `mod_ssl` packages:

```
yum install -y httpd mod_ssl
```

Note:

If you have proxy server, to complete download, edit the proxy settings for the external downloads to be successful.

 **Note:**

Install Apache Web Server and **mod_ssl** packages together as the httpd package executes a post-install script which uses **mod_ssl** for generating a localhost certificate. The certificate is required for the default httpd service configuration. If the certificate is not generated, enter the following lines in the `/etc/httpd/conf.d/ssl.conf` file to start the httpd server:

```
SSLCertificateFile /etc/pki/tls/certs/localhost.crt
SSLCertificateKeyFile /etc/pki/tls/private/localhost.key
```

 **Note:**

If you have installed Session Monitor using the ISO, then httpd and mod_ssl are pre-installed.

If the localhost certificates are not generated, perform the following workaround to start the Apache server:

- Remove the **ssl.conf** file from the **etc/httpd/conf.d** file.
 - Add the line **Listen 443** at the beginning of the file, **/opt/oracle/ocsm/etc/httpd/conf.d/pld.conf** which has a symbolic soft link in the same folder.
6. Run the following commands to install all additional packages:


```
yum groupinstall "Development Tools" -y
```
 7. Run the following commands to install the required httpd modules and to enable external authentication in Apache:


```
yum --enablerepo=ol7_optional_latest install mod_ldap
```
 8. Edit the **pld.conf** file:


```
vi /etc/httpd/conf.d/pld.conf
```
 9. Add following location section in `<VirtualHost_default_:443>`, after `RequestHeader unset X-Forwarded-User`:

```
<Location>
  RewriteEngine On
  RewriteCond %{LA-U:REMOTE_USER} (.+)
  RewriteRule .* - [E=RU:%1,L]
  AuthType basic
  AuthName <LDAP authentication>
  AuthBasicProvider ldap
  AuthLDAPURL <ldap:///dc=LDAP_Server,dc=com?uid?one>
  AuthLDAPBindDN "cn=ldapadm,dc=LDAP_Server,dc=com"
  AuthLDAPBindPassword
  Require valid-user
  RequestHeader unset X-Forwarded-Use
  RequestHeader set X-Forwarded-User %{RU}e
</Location>
```

Where:

- `< LDAP_Server >` is your LDAP server name

- <LDAP authentication> is the AuthName for Session Monitor LDAP authentication.
- <"ldap:///dc=LDAP_Server,dc=com?uid?one"> is your LDAP server IP address to which the authentication request is sent by Session Monitor. As DC and CN are LDAP specific, check the DC and CN values with your Local LDAP configuration.
- <password> is the password for LDAP server to which authentication to the specific user is to be processed. It should be a Hashed Password.

10. Uncomment following parameters:

```
RewriteEngine On
RewriteCond %{SERVER_PORT} 443
RewriteCond %{LA-U:REMOTE_USER} (.+)
RewriteRule .* - [E=RU:%1,L]
RequestHeader set X-Forwarded-User %{RU}e
```

11. Change the AuthName directive in the Location /me/logout.html to AuthName "LDAP authentication" or the 'AuthName' in the 'Location' tag, if in case of any change in it.

12. Run the following commands to stop and disable the nginx server:

```
systemctl stop pld-nginx.service
systemctl disable pld-nginx.service
```

13. Run the following command to switch the pld-webserver link to httpd:

```
ln -sf /usr/lib/systemd/system/{httpd,pld-webserver}.service
```

14. Run the following command to reload systemd for viewing the changes:

```
systemctl daemon-reload
```

15. Run the following command to start and enable the httpd

```
systemctl start httpd.service
systemctl enable httpd.service
```

16. Run the following command to start/re-start httpd server to enable external authentication:

```
service httpd start
service httpd restart
```

Result: The httpd server of Session Monitor has been configured for external authentication.

When you open the Session Monitor in web browser, the external authentication pop-up appears. On providing the correct LDAP user credentials, the user will be logged in successfully.

Secure LDAP (LDAPS) Support

For LDAPS support, follow these steps:

 **Note:**

The procedure in "Configuring Apache for Authenticating with LDAP Service" must be followed before executing the following steps to configure LDAPS:

1. Copy the CA certificate from the LDAP server and place it in a directory other than /root.

- ```
/opt/certs/<CA Certificate>
```
2. Give permissions for the directory which has the CA certificate.  

```
chmod -R 777 /opt/certs
```
  3. Modify the `/etc/hosts` file with a fully qualified DNS.  

```
"<DNS-IP> <Host Name> <Fully Qualified Host Name>"
```
  4. Modify `/etc/httpd/conf.d/pld.conf` to have the following line after CustomLog:  

```
LDAPTrustedGlobalCert CA_BASE64 </opt/certs/<CA Certificate>
```
  5. Modify the "AuthLDAPURL" URL from ldap to ldaps.  

```
AuthLDAPURL "ldaps://<Host Name>/dc=oracle,dc=com?uid,employeeType,gecos?one"
```

## Session Monitor Post-Installation Tasks

This section provides instructions for the post-installation tasks for Session Monitor.

Before starting the post-installation tasks, verify that Session Monitor installation tasks are completed and all components are installed. See [Installing Session Monitor Using the RPM](#).

## About the Platform Setup Application

The Platform Setup Application guides you through the Session Monitor configuration steps, including configuring the machine type, capture settings, and simple mail transfer protocol (SMTP) settings as follows:

1. Accept the license agreement to proceed with the Platform Setup Application.
2. The menu on the right shows your progress during configuration.
3. The Machine Type page sets which licensed Session Monitor applications are installed. In the Server Certificate page, you can upload your signed certificate for secure HTTPS connections.
4. Subsequent sections configure the Session Monitor server for your network. These steps are optional.  
Except for **Machine Type** and **Extensions**, you can review and change settings at any time by visiting the Platform Setup Application at `https:// ip_address /setup/`, where `ip_address` is the IP address of the server that hosts a Session Monitor application. This URL is valid for any Session Monitor server.
5. In the final step, each selected Session Monitor application is installed.

After a successful installation, the log in page appears for each of your licensed Session Monitor application.

## Platform Setup Application Initial Log In

All the Session Monitor application interfaces are accessed through encrypted HTTPS connections. At the initial login, your web browser may not recognize the server and displays the This Connection is Untrusted warning message. Click Confirm Security Exception to proceed.

For information about how to protect connections to the system and avoid the untrusted certificate warning in the future, see Oracle Communications Session Monitor Security Guide.

This section describes how to configure Session Monitor using the Platform Setup Application.

To configure Session Monitor:

1. In a web browser, go to `https://<ip_address>/setup`.  
The Platform Setup Application Log in page appears.
2. In the **Username** field, enter **sysadmin** and; in the **Password** field, enter **oracle**.  
The License Terms agreement page appears.
3. Accept each Session Monitor application license terms agreement, by selecting the **I agree to the license terms** check box.
4. Click **Proceed**.  
The Change Password dialog box appears.  
The Platform Setup Application page appears.
5. Change the password by doing the following:
  - a. In the **Set password** field, enter a new password.

 **Note:**

The password must have at least 8 characters. The password must contain at least one uppercase character. The password must contain a number. The password must contain a special character (@, #, -, \_, .).

- b. In the **Repeat password** field, re-enter the password used in the previous step, which verifies that the password value was entered correctly.
  - c. Click **Change**.  
The Machine Type page appears.
6. On the Machine Type page, select the machine type on which to install your licensed Session Monitor applications and components:
  - To install an Operations Monitor probe, select standalone Probe.
  - To choose different Session Monitor applications, select the **Mediation Engine** and then select the required product (or applications) as per the license:
    - To install Oracle Communications Operations Monitor, select the **Communications Operations Monitor** check box.
    - To install Oracle Communications Control Plane Monitor, select the **Control Plane Monitor** check box.
    - To install an Operations Monitor embedded probe, select the **Probe (embedded)** check box.

Only the checked items are included in the installation.

 **Note:**

The Machine Type page only appears the first time you configure Session Monitor prior to the products installation. Machine type cannot be changed after the PSA installation is completed.

You can select only one machine type for each installation process.

Packet Inspector probe is not supported on a Session Monitor probe with SIP/RTP sniffing for the calls and VQ analysis.

The products are machine-type specific and cannot be interchanged between machine types.

For example, the Probe machine type requires a probe product, and the Mediation Engine machine type requires the Operations Monitor product.

The machine type Mediation Engine Probe (embedded) must be chosen either with Operation Monitor or with Control Plane Monitor option selected.

7. Click **Continue**.

The machine type and application information appear in the status panel located on the right under the navigation list.

The Configuration page appears.

8. Configure the Session Monitor settings for the machine type you chose in step 5 in accordance with the terms of your license as follows:

- a. From the Capacity section in the Concurrent calls field, enter the number of concurrent calls printed on your license.
- b. If you have licensed RTP recording, select the RTP Recording check box.
- c. From the Capacity section in the Concurrent RTP streams field, enter the number of concurrent RTP streams printed on your license.

 **Note:**

The number entered in the Concurrent RTP streams field can cause performance and stability issues if it is set higher than what your network hardware supports. Values above 20 are not recommended. Changes to the RTP recording setting take effect only after restarting the system.

- d. From the Extensions section, select all the product extensions you have licensed.

 **Note:**

You cannot change the configured extensions after the installation. All Oracle Communications Session Monitor Enterprise users should select Media quality .

9. Click **Continue**.

The Disk Usage page appears.

10. On the Disk Usage page, specify the maximum disk usage partition for the Packet Inspector.

 **Note:**

On the Disk Usage page, specify the maximum disk usage partition for the shared filesystem containing the database/data storage (single raid systems). For systems with two raid arrays you can select the usage independently for both filesystems. For Probes with Packet Inspector feature you would be able to select the maximum storage capacity.

The ME Connection List page appears.

 **Note:**

The **ME Connection List** page appears only if you have selected machine type as Probe or Mediation Engine and Probe.

11. (Optional) If you selected Probe on the Machine Type page, set which mediation engines are connected to the Operations Monitor probe.
  - a. Click **Add a new ME**.
  - b. In the Hostname or IP field, enter the IP address of the machine that hosts the mediation engine.
  - c. In the Port field, enter the port number of the mediation engine. For a Cleartext transmission enter 4741 and for TLS enter 4742.
  - d. In the Name field, enter a name for the mediation engine.
  - e. In the TLS field, select the checkbox for TLS transmissions or leave the checkbox unchecked for Cleartext.

The Operations Monitor Probe can transmit data to one or more mediation engines with either transport layer security (TLS) encryption, or with un-encrypted Cleartext. A mediation engine can connect to more than one Operations Monitor Probe or more than one Session Border Controller Probe.

12. Click **Continue**.

The Trusted Certificate page appears.

13. In the **Upload signed certificate** field, select **Browse** and locate the signed certificate file. Click **Continue**.

(Optional) By default, the mediation engine machine accepts only encrypted transmissions, (unless the mediation engine and probe are on the same machine); for Cleartext transmissions select the **Accept insecure connections from remote probes** check box.

Click **Continue**.

The Server Certificate page appears.

14. All Session Monitor interfaces are accessed through encrypted (secure) HTTPS connections. Each Session Monitor machine uses a unique certificate to establish secure connections and to guarantee its authenticity and protect users' data.

Do one of the following:

- To use the self-signed certificate, click **Continue**.
- To sign the server certificate with your organization's Public Key Infrastructure (PKI):
  - a. Select **Download request**.
  - b. Sign the certificate with the X.509 format.
  - c. In the **Upload signed certificate** field, select **Browse** and locate the signed certificate file.
  - d. Click **Continue**. The SMTP Configuration page appears.

 **Note:**

- To regenerate a key and certificate on install, select **Regenerate key and self-signed certificate on install** and click **Continue**.
- (Optional) Click **Download current certificate** to download the current self-signed certificate.

15. Session Monitor can send notifications and alerts directly to a user's email address. If you require notifications or alerts, select the Enable SMTP check box and fill in the relevant fields with your SMTP server details.
16. Click **Continue**.

The Capture Settings page appears.
17. The **Capture Settings** page contains a list of configured network interfaces. Monitoring can be enabled and disabled. You should have configured network devices while installing Oracle Linux 7.
18. Click **Continue**.

The Data Retention page appears.
19. Click **Continue**.

The Install page appears.
20. (Optional) Click **Download Configuration**, which downloads your configuration settings file in the default download location of your system.
21. Open the **psa\_conf.json** configuration file and verify your settings.
22. Click **Install**.

The **Did you select the right applications** dialog box appears.
23. Verify that you have chosen the correct Session Monitor applications and components for installation; after installation is complete, the selected applications and components cannot be changed.

Click **OK**.

The Platform Setup Application initiates the installation and reports its progress.

The Installation Complete dialog box appears.
24. Do one of the following:
  - To go back to the Platform Setup Application, click **Back to Setup**.



- To go to a Session Monitor application dashboard, click **Go to Application**.
25. The credentials for logging in to Session Monitor are:
- For Platform Setup Application, enter the user name provided by Oracle and the password you set up in step 5.
  - For Operations Monitor and Control Plane Monitor, enter the login credentials provided by Oracle Sales Consultant.

## Changing Community MySQL Edition to Enterprise Edition

Change the edition of MySQL by doing the following:

1. Go to the Oracle Software Delivery web site:  
<https://edelivery.oracle.com>
2. Read and accept the license agreement and export restrictions and click **Continue**.
3. Download the latest Enterprise edition of MySQL in version 5.7.10.
4. Uninstall the Community edition of MySQL by running the following command:  

```
yum remove -y mysql-community-common
```
5. Install the Enterprise edition of MySQL by running the following command:  

```
yum install -y mysql-commercial*.rpm
```
6. Install the yum utils by running the following command:  

```
yum -y install yum-utils
```
7. Enable the latest Oracle Linux 7 add-on's by running the following command:  

```
yum-config-manager --enable ol7_latest ol7_UEKR4 ol7_developer_EPEL ol7_optional_latest ol7_addons ol7_UEKR3 ol7_UEKR5
```

### Note:

Latest Public Yum Repo has to be downloaded for enabling the repo if you have not downloaded as part of Configuring Repos and Proxies.

# 3

## Configuring Session Monitor

This chapter describes how to configure Oracle Communications Session Monitor.

### About the Platform Setup Application

The Platform Setup Application (PSA) guides you through the configuration steps to get the Session Monitor system running, including configuring the machine type, capture settings, DNS settings, and SMTP settings.

The menu on the right shows your progress in the overall configuration.

### Platform Setup Application Initial Log In

This section provides how to log into Platform Setup Application initially.

1. Open the web browser and enter the URL provided by the System Administrator.
2. Confirm the security exception to proceed.

The Log in page appears.

3. Enter the **Username** and **Password**. For default username and password, contact your Oracle representative.
4. Click **Sign in**.
5. **Review and Accept** the license of the software to continue.

The Platform Application Setup page appears.

### Changing Your Password

To change your password, click your user name in the top right-hand corner of the screen and select Change Password from the drop-down menu.

In the **Change Password** dialog box, enter the old and the new passwords in the indicated fields and click **Change**.

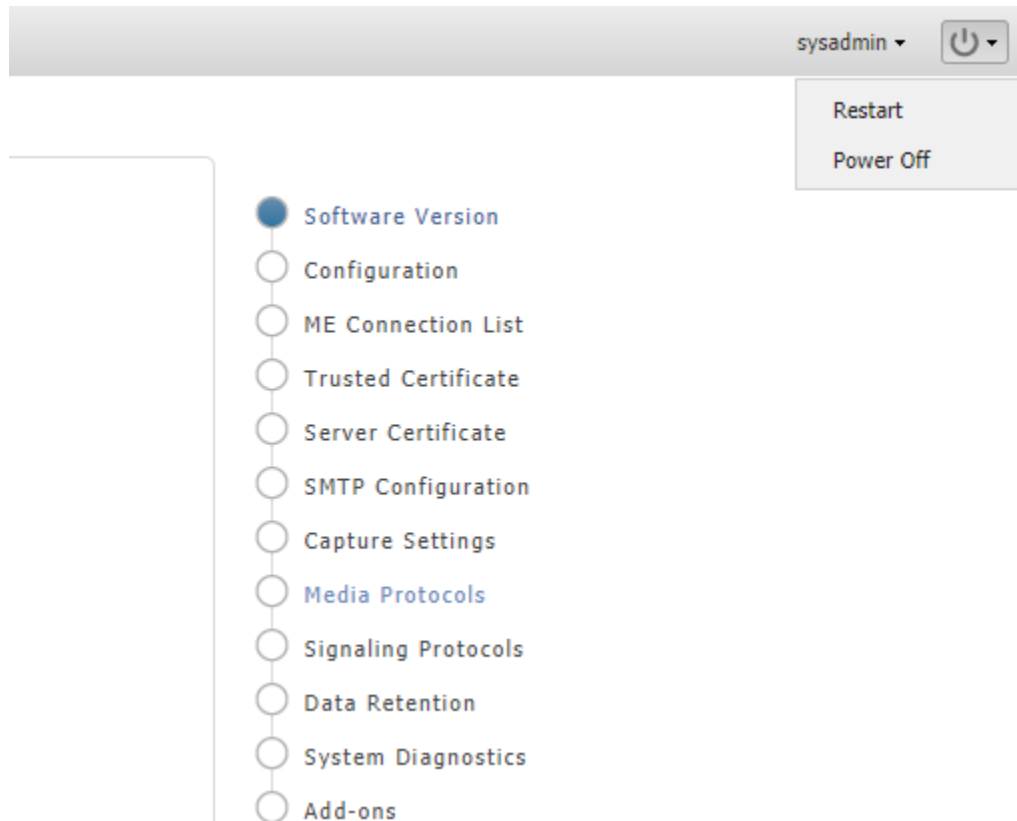
#### Note:

The password contains only digits, letters and white spaces.

### Restarting or Powering Off Session Monitor

The restart and power off buttons are accessible through the power button on the top right-hand corner of the screen.

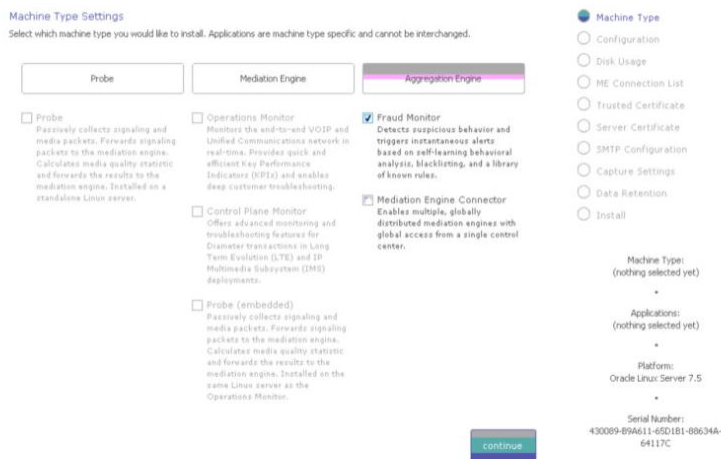
The following figure shows the drop-down menu when you click the power button.



After selecting an option, you are prompted a final time to confirm that you wish to proceed.

## Selecting the Machine Type

The following figure shows the Machine Type Settings page.



The Machine Type Settings page allows you to select which products you want to install. This page only appears the first time you configure Session Monitor prior to the products installation.

Select your machine type by clicking **Probe** or **Mediation Engine** or **Aggregation Engine** button. This will enable the corresponding product selection.

 **Note:**

- You can select only one machine type per installation.
- Packet Inspector is not supported on the machine collocated with Operations Monitor or Probe with SIP/RTP sniffing for the calls and VQ analysis.

Next, select the check boxes next to the products that you want to install. Only checked items are included in the installation.

 **Note:**

The products are machine type specific and cannot be interchanged between machine types.

For example, the Probe machine type requires a probe product, and the Mediation Engine machine type requires the Operations Monitor product.

After selecting the products, click **continue** to proceed with the installation. Your machine type and product selections should appear in the status panel located on the right under the navigation menu.

## Configuring Session Monitor

This step in the configuration process allows you to configure Session Monitor settings for this machine in accordance with the terms of your license.

 **Note:**

If you do not have a valid Session Monitor license, contact Oracle.

The following figure shows the Configuration page.

**Configuration**

Please note that you are only allowed to use the products, modules and extensions that you have purchased. For any questions please contact your sales representative.

**Capacity**

Please check your license and enter the capacities that were licensed to you:

Concurrent calls:

RTP Recording

Concurrent RTP streams:

**Extensions**

- App support
- CDR generator
- Diameter
- ENUM
- Fraud Monitor
- Gateway control protocols
- Media quality
- SAU
- SS7
- Packet Inspector

**Note:** If you have multiple Session Monitor installations, make sure to apply the same configuration to all of them.

**Note:** Extensions cannot be changed when the system is already configured.

On the left side of the page you must enter the number of concurrent calls printed on your license. On the right side you must check the product extensions you have a license to use. All enterprise customers should automatically check **Media quality**.

 **Note:**

The number of Concurrent RTP streams can cause performance and stability issues if it is set higher than the hardware and the network permits. Values above 20 are not recommended. Changes to the RTP recording setting take effect only after a restart of the system.

If you have multiple servers involved in your set up (additional standalone Probes servers connected to the Mediation Engine), this setting must be set on each Probe (unless certain Probe is not sniffing Media so that RTP recording is not really applicable for the Probe). In such scenarios, the value that is set should be same on each node, on the Mediation Engine (or the Mediation Engine with local Probe), and the Probes.

Click the **continue** button to navigate to the ME Connection List page.

## Mediation Engine Connection List

For a Probe machine type, the Mediation Engine Connection List page allows you to configure which Mediation Engines the Operations Monitor Probe connects to.

The following figure shows the ME Connection List page.

The Operations Monitor Probe can connect to one or more Mediation Engines, using TLS encryption, or with some configurations, also cleartext. Likewise, a Mediation Engine can connect to more than one Operations Monitor Probe (as well as Session Border Controller Probes).

On the Mediation Engine, cleartext connections are usually on port 4741 and encrypted connections on port 4742. For encrypted connections, the Operations Monitor Probe and the Mediation Engine need to be able to verify the certificate of the other party.

List of Mediation Engines

List of Mediation Engines that can connect to this Probe. It's possible to add new ones and the existing ones can be edited or removed.

| List of Mediation Engines |      |           |        |            |
|---------------------------|------|-----------|--------|------------|
| Add a new ME              |      | Edit      | Remove |            |
| TLS                       | Port | Host      | Name   | Connection |
| No                        | 4741 | 127.0.0.1 | local  | n/a        |

Reset changes

continue

- Machine Type
- Disk Usage
- Configuration
- ME Connection List
- Trusted Certificate
- Server Certificate
- SMTP Configuration
- Capture Settings
- Data Retention
- Install

Machine Type:  
Mediation Engine with Probe

Applications:  
Operations Monitor  
Probe

Serial Number:  
4300E7-06975A-C9BFD3-  
0CB3F7-627D49

The Mediation Engine machines by default only accept encrypted connections (unless the Mediation Engine and Probe are on the same machine); for unencrypted connections the check box Accept insecure connections from remote probes on the Trusted Certificate page must be checked.

The following figure shows the Trusted Certificate page.

**Trusted Certificate**

For secure (TLS) connections between **Mediation Engines** and **OCSM Probes / SBC Probes**, each machine has to have a valid certificate for the other machine. This can be either:

- the certificate found on the "Server Certificate" page of the other machine (self-signed)
- the corresponding CA certificate (of the CA that signed the certificate)

OCSM Probes use TLS connections on port 4742 and optional cleartext connections on port 4741.  
SBC Probes use TLS connections on port 4740 and optional cleartext connections on port 4739.

List of trusted certificates

| More details are available by clicking on the columns. |            | Remove selected |
|--------------------------------------------------------|------------|-----------------|
| Subject                                                | Expires at |                 |
|                                                        |            |                 |

Upload a trusted certificate

Trusted certificate...

Accept insecure connections from remote probes

Machine Type:  
Mediation Engine with Probe

Applications:  
Operations Monitor  
Probe

Serial Number:  
4300E7-06975A-C98FD3-  
0CB3F7-627D49

## Typical Connection Scenarios

### Mediation Engine and Operations Monitor Probe Are on the Same Machine

For setups with a Mediation Engine machine with an embedded Probe, a cleartext connection is automatically added to the ME connection list. For cleartext connections, no certificates are exchanged.

### One Mediation Engine and Two Operations Monitor Probes

For setups with one Mediation Engine and two Operations Monitor Probes, the self-signed server certificates of both Operations Monitor Probes are uploaded as trusted certificates on the Mediation Engine, and the self-signed server certificate of the Mediation Engine is uploaded on both Operations Monitor Probes as a trusted certificate. On each Operations Monitor Probe, the IP of the Mediation Engine is added to the ME connection list with TLScheck box selected.

The following table describes the actions to configure the connections between one Mediation Engine and two Operations Monitor Probes.

**Table 3-1 One Mediation Engine and Two Operations Monitor Probes**

| Machine          | Action                                                                                                                                                                                                                                                                             |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mediation Engine | <ul style="list-style-type: none"> <li>Download the Server Certificate.</li> <li>Upload the Server Certificate of the Operations Monitor Probe1 to Trusted Certificate.</li> <li>Upload the Server Certificate of the Operations Monitor Probe2 to Trusted Certificate.</li> </ul> |

**Table 3-1 (Cont.) One Mediation Engine and Two Operations Monitor Probes**

|                            |                                                                                                                                                                                                                                                                         |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operations Monitor Probe 1 | <ul style="list-style-type: none"> <li>• Download the Server Certificate.</li> <li>• Upload the Server Certificate of the Mediation Engine to Trusted Certificate.</li> <li>• Add IP of the Mediation Engine to the ME Connection List, with TLS connection.</li> </ul> |
| Operations Monitor Probe 2 | <ul style="list-style-type: none"> <li>• Download Server Certificate.</li> <li>• Upload Server Certificate of the Mediation Engine to Trusted Certificate.</li> <li>• Add IP of Mediation Engine to ME Connection List, with TLS connection.</li> </ul>                 |

### Two Mediation Engines and One Operations Monitor Probe

For setups with two Mediation Engines and one Operations Monitor Probe, the self-signed server certificate of the Operations Monitor Probe is uploaded as trusted certificate on both Mediation Engines, and the self-signed server certificates of the Mediation Engine are uploaded on the Operations Monitor Probe as a trusted certificate. On the Operations Monitor Probe, the IPs of the Mediation Engines are both added to the ME connection list with TLScheck box selected.

The following table describes the actions to configure the connections between two Mediation Engines and one Operations Monitor Probe.

**Table 3-2 Two Mediation Engines and One Operations Monitor Probe**

| Machine                  | Action                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mediation Engine 1       | <ul style="list-style-type: none"> <li>• Download the Server Certificate.</li> <li>• Upload the Server Certificate of the Operations Monitor Probe to Trusted Certificate.</li> </ul>                                                                                                                                                                                                                                                      |
| Mediation Engine 2       | <ul style="list-style-type: none"> <li>• Download the Server Certificate.</li> <li>• Upload the Server Certificate of the Operations Monitor Probe to Trusted Certificate.</li> </ul>                                                                                                                                                                                                                                                      |
| Operations Monitor Probe | <ul style="list-style-type: none"> <li>• Download the Server Certificate.</li> <li>• Upload the Server Certificate of Mediation Engine 1 to Trusted Certificate.</li> <li>• Upload the Server Certificate of Mediation Engine 2 to Trusted Certificate.</li> <li>• Add IP of Mediation Engine 1 to ME Connection List, with TLS connection.</li> <li>• Add IP of Mediation Engine 2 to ME Connection List, with TLS connection.</li> </ul> |

### All Other Scenarios

For setups with more than two Operations Monitor Probes or Mediation Engines, Oracle recommends that you use PKI (Public Key Infrastructure) with root certificates as described in *Oracle Communications Session Monitor Security Guide*.



# Trusted Certificates

The Trusted Certificates page is used to configure the authentication of session border controllers (SBCs). This step is necessary before attempting to connect SBCs to Session Monitor.

For secure (HTTPS) connections between Mediation Engine Connectors and Mediation Engines each machine must have a valid certificate for the other machine. The same rules for certificates as for ME and Probe.

## ISR Server

A Mediation Engine requires a valid certificate of an ISR server in order to establish a secure (HTTPS) connection to it.

## Fraud Monitor

For secure (HTTPS) connections between Fraud Monitor and Mediation Engine, each machine must have a valid certificate for the other machine. The same rules for certificates as for ME and Probe.

For more information, see the discussion about connection with Oracle Session Border Controller in *Session Monitor Security Guide*.

# Configuring the SMTP Settings

The following figure shows the SMTP Configuration page.

**SMTP Configuration**

The SMTP server will be used by the Session Monitor to send emails to users specified in configurable alerts.

Enable SMTP

Secure SMTP (TLS):

SMTP server:

SMTP port:

Mail sender:

Subject prefix (optional):

SMTP authentication (optional):  Enable authentication

Username:

Password:

- Software Version
- Configuration
- ME Connection List
- Trusted Certificate
- Server Certificate
- SMTP Configuration
- Capture Settings
- Media Protocols
- Signaling Protocols
- Data Retention
- System Diagnostics
- Add-ons

**Machine Type:**  
Mediation Engine with Probe

**Applications:**  
Operations Monitor  
Probe

**Platform:**  
Oracle Linux Server 7.3

**Serial Number:**  
430000-EF6D65-3B1B99-021B54-C86BFB

Session Monitor can send notifications and alerts directly to users' email addresses. Which notification to send to which address is configured in the relevant products. However, you first need to configure the SMTP settings properly for this feature to be available.

## Setting Up the Mail Server

To use the email notification feature, select **Enable SMTP** check box. The system needs an SMTP server to send emails. Contact your network administrator to find out the address of the server your organization uses. The default port is the standard port 25.

If the server requires a valid email account, you will need to create one for Session Monitor. Then, select **Enable authentication** check box and enter the credentials.

## Setting Up the Email Notifications

You can choose how the emails from Session Monitor will look like in the users' mailboxes. The field **Mail sender** is the email address Session Monitor will use; users will see this address in the **Sender:** or **From:** field of the emails. You can optionally specify a **Subject prefix** ; which appears at the beginning of the subject of the emails and make it easy to identify Session Monitor's emails in users' inbox.

## Configuring the Capture Settings

The Capture Settings page contains a list of configured network interfaces, with a toolbar for deleting interfaces, as well as a restore button to reset the last applied settings (usually, you want to add interfaces you didn't add during the installation procedure).

There's also a check box below the network list that can be checked if you wish to apply capture settings that won't allow you to reconnect to the Platform Setup Application again.

The following figure shows the Capture Settings page.

Capture Settings

Configure interface capture settings for the Session Monitor below.  
The settings will not take effect until you press the 'apply/continue' button.

| Port  | Slot    | Details                                                                                                | Status | Monitoring                          |
|-------|---------|--------------------------------------------------------------------------------------------------------|--------|-------------------------------------|
| ens18 | 00:12.0 | 82540EM Gigabit Ethernet Controller<br>IP address(es):<br>192.168.123.113<br>fe80::9c46:78ff:feee:3f73 | Up     | <input type="checkbox"/>            |
| ens19 | 00:13.0 | 82540EM Gigabit Ethernet Controller                                                                    | Up     | <input checked="" type="checkbox"/> |

Refresh (discard unapplied)

continue

- Machine Type
- Disk Usage
- Configuration
- ME Connection List
- Trusted Certificate
- Server Certificate
- SMTP Configuration
- Capture Settings**
- Data Retention
- Install

Machine Type:  
Mediation Engine with Probe

Applications:  
Operations Monitor  
Probe

Serial Number:  
4300E7-06975A-C98FD3-  
0CB3F7-627D49



**Note:**

Monitoring is only enabled for machines that are configured as probes. On other machines, the monitoring check box is grayed out.



**Important:**

Do not configure dummy interfaces with DHCP if there is no DHCP server to give an IP. When applying settings with a dummy interface using the DHCP method wait for the DHCP client to time out (usually one minute).

## Configuring Data Retention

The Data Retention page is used for configuring data retention in database for different data sources. Some settings depend on the license settings and will be available only if the associated configuration is set.

The following figure shows the Data Retention page.

**Data Retention**  
Configure for each type of collected data how many days they are allowed to be stored.

Specify a number of days between 1 and 999. Setting the number of days to 0 signifies no purging, if a separate configuration parameter is not available to control purging.

INFO: This settings only affect the maximal lifespan of the data. It is limited by available storage capabilities.

INFO: Retention times will not affect the amount of storable data.

**Data sources**

Subscriber Data - Calls:

CPM Subscriber Data:

Packet Inspector:

Subscriber Data - Registrations:

Media recording:

[continue](#)

- Machine Type
- Configuration
- Disk Usage
- ME Connection List
- Trusted Certificate
- Server Certificate
- SMTP Configuration
- Capture Settings
- Data Retention
- Install

Machine Type:  
Mediation Engine with Probe

Applications:  
Operations Monitor  
Control Plane Monitor  
Probe

Serial Number:  
430160-DD5695-D0A2DD-  
591876-474658

Data retention is configured in days per data source. A value of 0 disables time based data retention.



**Note:**

The settings only affect the maximal lifespan of the data. Data availability is limited by available storage capabilities.

 **Note:**

Retention times does not affect the amount of storable data.

You can configure data retention times for the following data sources:

- **CPM Subscriber Data:** Specifies the number of days to consider for storing the Diameter S6 transaction data. Enabled by the CPM module.
- **Media Recording:** Specifies the number of days to consider for storing the RTP recordings. Enabled by RTP recording configuration.
- **Packet Inspector:** Specifies the number of days to consider for storing the network-traffic history. Enabled by Packet Inspector configuration.
- **Subscriber Data - Calls:** Specifies the number of days to consider for storing the call meta data and signaling.

 **Note:**

Saved calls are not deleted by this option. Saved calls must be deleted by operators. (Optional) Disable user permissions for saved call functionality.

- **Subscriber Data - Registration:** Specifies the number of days to consider for storing the registration events.

 **Note:**

CDR/MDRs are not supported. Data retention affects data in the database only. For deleting CDR/MDRs, use FTP to delete files after downloading.

## Secure Configuration

To help protect users of Session Monitor and consumers' data, see the Session Monitor Security Guide for information on the security features of Session Monitor.

During the installation of a Session Monitor server, you will encounter the server certificate and trusted certificate pages.

## Server Certificate

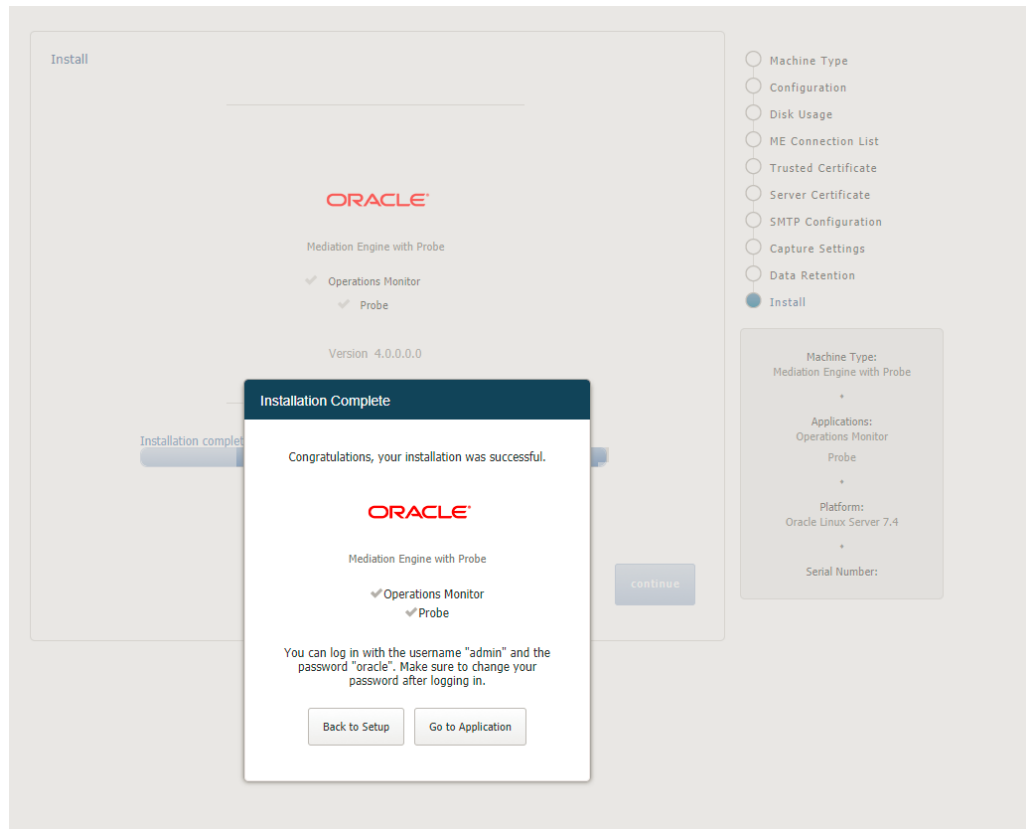
The Server Certificate page is used to see and change the certificate used by this server. This step is recommended to protect users' data.

For more information, see the discussion about encryption and certificates in the Session Monitor Security Guide.

## Installing the Products

The Install page summarizes the components to install. Check that you selected the correct components; after the installation is complete, the selection of the components cannot be changed.

The following figure shows the Install page.



Click **Install** to start with the installation. The Platform Setup Application initiates the installation process and reports back the progress. The installation process might take a few minutes to complete.

You can click on the **Session Monitor** button when the installation is complete. This will bring you to the installed products' interface.

# 4

## Session Monitor Post-Installation Tasks

This chapter provides instructions for Oracle Communications Session Monitor post-installation tasks.

### Installing Software Update

After you log in to the product interface, you can see the status of the system or update the system. A system update will update all applications as well as the Platform Setup Application itself.

The Software Version page shows the currently installed components and the software version.

To install a software update, go to the Software Version page and select the update file (file type .rpm) that was provided by Oracle or your service provider. Click **Apply** to initiate the upload.

When the upload has finished, the page will show the version number and issue the date of the update. Click **Install** to proceed with upgrading the system. You can also abort the upgrade by clicking **Clear**.

#### Important:

Session Monitor or parts of it may not be available during the update process.

Platform Setup Application will show the progress during the upgrade. You may click **Close** to hide the progress window.

After the successful upgrade, establish an SSH session with the product and execute the following command:

```
source /opt/oracle/ocsm/ocsm_env.sh
```

#### Note:

If you have a setup with multiple servers (for example, ME, MEC, Probe(s) and OCFM), upgrade all of them at the same time. Running different servers (ME, MEC, probe(s), OCFM) of the Session Monitor on different versions is not supported.

### Upgrading the MySQL Version

Session Monitor version, 4.1.0.0.0 supports both MySQL versions, 5.5 and 5.7. If you have upgraded from a previous Session Monitor version, your system will be running MySQL 5.5. To upgrade to MySQL 5.7 for the latest performance updates and improvements, perform the following steps in the maintenance window:

1. Log in to the Session Monitor server console as the root user and run the following command to load the environment variables.

```
source /opt/oracle/ocsm/ocsm_env.sh
```

2. Run the following command to stop the Session monitor services:

```
pld-systemctl stop
```

3. Upgrade MySQL from the official MySQL documentation.

4. Run the following command to install MySQL compatibility libraries:

```
yum install mysql-commercial-libs-compat
```

5. Run the following command to upgrade the MySQL:

```
mysql_upgrade
```

 **Note:**

The upgrade duration depends on the database size.

6. Run the following command to deploy the Session Monitor MySQL 5.7 configuration:

```
cp /opt/oracle/ocsm/etc/iptego/my-5.7.cnf
/opt/oracle/ocsm/etc/iptego/my.cnf
```

7. Run the following command to restart MySQL and Session Monitor services:

```
systemctl restart mysqld
pld-systemctl start
```

## Media Protocols

The Media Protocols menu is available after the installation process has finished and only for machine type Probe (which includes the machine type Mediation Engine with Probe).

You use the Media Protocols page to identify the RTP traffic that the Probe looks for. The Probe accepts only the traffic that matches the BPF filter.

## Filters

You can set the media protocols filter as follows:

- **Check all traffic for signaling:** When this check box is enabled, all traffic (including the traffic that matches the BPF filter rule) is passed to the signaling probes for filtering using the signaling protocols filters. When this check box is disabled, only the traffic that does not match the BPF filter rule is passed to the signaling probes. If you use Packet Inspector for media recording, you need to enable this option to filter the media packets using the Packet Inspector filter in **Signaling Protocols**.

 **Note:**

Packet Inspector supports STCP, TCP, and UDP as transport protocol for capturing the signaling network traffic or media. Due to the design limitation, other transport protocols such as ICMP are not supported. Enabling this option may decrease system performance.

- **BPF filter:** This filter identifies the RTP traffic. Only the traffic that matches this filter rule is considered. You might want to configure the filter rule to pick up only the packets you are interested in. Ignoring the unwanted packets reduces the stress on the system and increases performance. The traffic that does not match this filter is passed to the signaling probes for filtering using the signaling protocols filters

See the Signaling Protocols section for more information about signaling protocols.

See the Filter Syntax section for more information about filters.

## Status

The following status are shown for the RTP packets:

- **Active streams:** Specifies the number of RTP streams found. Only the traffic that matches the filter is counted.
- **Packets processed:** Specifies the packets that match the filter and processed successfully.
- **Packets dropped:** Specifies the packets that match the filter but not processed due to insufficient resources.

## Signaling Protocols

The Signaling Protocols menu is available after the installation process has finished and only for machine type Probe (which includes the machine type Mediation Engine with Probe).

You use the Signaling Protocols page to identify the types of traffic the various probes (which sniff traffic) look for. The Probe accepts only the traffic that matches the filter rule and sends them to the Mediation Engine.

You might want to configure strict filtering rules for several reasons:

- The probes process all traffic that matches the filter. For most installations, the high volume of traffic makes inspecting every packet infeasible. Ignoring unnecessary packets, therefore, puts less stress on your system and makes subsequent analysis easier. For example, you may want to make sure the signaling probe, which monitors SIP, does not also get all the RTP traffic.
- You might not be interested in certain sources of traffic, even though the machine would pick it up.
- More complex VLAN configurations.

The default filters are sufficient for most installations and provide a good starting point.

After you configure the filters, it takes a few seconds for the probe(s) to reconfigure. The statistics on this page should show the totals for the new filters. The **Packets processed** statistic is a good indicator of how the filters are working.



 **Note:**

- Make sure to use vlan keywords in the filters when that is used on the network.
- Make sure to change the default filters if you use non-standard ports or other options.
- Traffic is first filtered using the media protocols setting. Only the traffic that does not match the media protocols BPF filter (except when **Check all traffic for signaling** filter option is enabled) is passed to the signaling probes.
- If you use Packet Inspector for recording media, you need to include media packets in the Packet Inspector filter.
- You need to ensure that there is sufficient disk space for storing media on the Probe machine. Media packets are initially stored on the Probe machine. The Probe forwards the packets to the Mediation Engine only when a user downloads the media to a PCAP file. When the disk is full, the Probe overwrites the calls stored on the disk with new calls. You can define the Packet Inspector filter to restrict the calls stored on the Probe and thus minimize calls that are overwritten.

For more information about filters, see the Filter Syntax section.

## Packet Deduplication

You can select to turn on packet deduplication for the associated traffic type. If you turn on packet deduplication, you must also provide a time value in milliseconds. The value should be greater than zero.

Packet deduplication is done at L3 and above and it is best effort. Some types of traffic might not get deduplicated, for example, duplicates on nested VLANs, ipv6, and so on.

There is a System Setting to enable deduplication in the core, which should be enabled if there are multiple Probes connected to one ME, and seeing the same traffic. If traffic is seen without and with vlan tags, you should also disable VLAN awareness in **System Setting**.

## Statistics per Protocol

The following statistics are shown for each protocol:

- **Rate:** Specifies the total number of packets accepted after the filtering.
- **Packets processed:** Specifies the number of packets processed in the last second. Only packets that match the filter are processed.

## Global Statistics

The following statistics are shown for all devices:

- **Total sniffed:** Specifies the number of packets sniffed across all configured devices.
- **Total dropped:** Specifies the number of packets that were not processed. Packets were dropped either by the NICs or during processing due to system performance reasons. If possible, tighten the filter rules and disable the **Check all traffic for signaling** filter option

in **Media Protocols** to ignore unnecessary packets and reduce stress on the system. If that is not possible, consider upgrading the machine.

## System Diagnostics

The System Diagnostics menu allows the creation of a report with information on the installation. This report may be requested by the support team in case of issues.

### Creating a Report

A report can be created by clicking **Create**. This may take several minutes to complete. Afterwards, the report can be downloaded as a file by clicking **Download**. This file can then be sent to the support team, for example by email.

If a report exists, its creation date will be shown. It can be downloaded as often as necessary, but there can be only one report at a time; creating a new report will overwrite any existing one.

Reports are deleted around midnight UTC.

### Report Contents

The contents of a report include:

- Information on the available hardware of the machine that the monitoring solution is running on
- Log files
- Configuration of the monitoring solution
- Statistics about the performance and status of components of the system and of the monitoring solution
- If the check box **Include mysql dump...** is checked, the report includes a dump of most of the database tables. Note that the respective tables might be huge.
- If the check box **Include mysql dump...** is not checked, the report will include only minimal information about the database tables.

#### Note:

Sensitive information is removed before report creation, including, but not limited to, passwords, keys, and certificates.

## Filter Syntax

The filter syntax used is the same as tcpdump or libpcap. For an example, see <https://wiki.wireshark.org/CaptureFilters>.

The following filters are also known as BPF filters:

- (tcp port 5060)
- ((udp or tcp) and port 5060)
- (vlan (udp or tcp) and port 5060)

- (tcp portrange 5060-5070)
- (not port 5060)
- (host 10.10.0.5 and port 5060)
- (not host 10.10.0.5 and port 5060)
- (not ether dst 12:34:56:78:90:ab)

Entries with a vlan keyword must be included for networks using VLANs. It is harmless to include them on networks which don't use VLANs, but do make sure there is a separate identical filter without the vlan. For example, (tcp port 5060) or (vlan and tcp port 5060).

# 5

## Installing and Configuring DPDK for Session Monitor

This chapter provides instructions for installing and configuring Data Plane Development Kit (DPDK) for the Oracle Communications Session Monitor to monitor high volume of network traffic.

DPDK provides sniffing performance for some of the Intel network cards and network traffic patterns. If you have a compatible network card, you can enable DPDK.

### Note:

See Oracle Communications Session Monitor Release Notes to verify if you need to update DPDK. If you need to update DPDK, verify if the DPDK requires latest Oracle Linux Platform.

DPDK is a special architecture supported by specific network card designs, drivers, and server architectures, that improves performance when processing network traffic. For high network traffic monitoring, you can select to enable DPDK option on Session Monitor Probes. DPDK uses NUMA architecture special feature to have faster access to traffic written from a Network Card and to enhance the performance.

DPDK architecture involves two parts for Session Monitor Probes. The daemon is responsible for network traffic analysis (rat) is compiled against a specific DPDK library, and is deployed upon Session Monitor installation. For DPDK to work, the DPDK driver must be downloaded and installed on the Probe, as well.

## System Requirements

The following sections describe the hardware and software requirements for installing and configuring DPDK for Session Monitor.

### Note:

The software and hardware details mentioned in this section are minimum requirements to enable DPDK for capturing high volume of network traffic. Contact Oracle Support for more assistance.

## Hardware Requirements

This section describes the hardware requirements for installing and configuring DPDK.

### Minimal Requirements

Following are the list of minimum hardware requirements:

- Probe machine (with DPDK) (2 Intel processors, each with 8 cores, 8 GB RAM, Intel based network card)
- Mediation Engine and Probe in one machine (at least 2 Intel processors and 24 cores in total, 24 GB RAM, Intel based network card)

### Supported Servers

For supported servers, see the Session Monitor System Requirements section.

### Supported Networking Cards

The following networking cards are supported:

- Sun Dual Port 10 GbE PCIe 2.0 Networking Card with Intel 82599 10 GbE Controller
- Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP
- Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF

## Software Requirements

### Supported DPDK versions for Session Monitor

The following table lists the supported versions of DPDK.

**Table 5-1** Table 5-1 DPDK Support Versions for Session Monitor

| DPDK Version | Session Monitor Release  |
|--------------|--------------------------|
| 16.07        | Supported from 3.4.0.0.0 |

## Installing and Configuring DPDK with Internet

This section describes the procedure for installing and configuring DPDK for session monitor.

### Note:

You must be connected to the internet before starting the installation. Running the following command installs, downloads the required files, and configures the DPDK automatically.

For DPDK installation, for Oracle X7-2 server has the following pre-requisite:

Create a file, `/opt/oracle/ocsm/etc/iptego/white_list_dpdk.local` with the value `i140e` before triggering DPDK installation.

1. Log into the Platform Setup Application page:
  - a. Select **Capture Settings**.
  - b. Check the box in **Monitoring** column against each sniffing interface that you want to use for capturing the traffic.

2. Log into the machine that hosts the probe or mediation engine and probe as a root user.
3. (Optional) For better understanding of the network, CPU, and NUMA nodes of the server, you can run the following command to review the output of the `system_layout.py` script, that will display system information:

```
source /opt/oracle/ocsm/ocsm_env.sh
/opt/oracle/ocsm/usr/share/pld/rat/system_layout.py
```

4. Run the following commands which guides you through the installation:

```
source /opt/oracle/ocsm/ocsm_env.sh
/opt/oracle/ocsm/usr/share/pld/rat/configure_dpdk.py
```

The `configure_dpdk.py` script downloads and installs the required DPDK driver, the corresponding Kernel headers required for compiling DPDK driver, compiles, installs the driver, and creates server and Session Monitor DPDK related configuration.

5. (Optional) To view all the available advanced options, run the following command:  

```
/opt/oracle/ocsm/usr/share/pld/rat/configure_dpdk.py -h
```
6. Reboot the machine that hosts the probe or mediation engine and probe.

## Installing and Configuring DPDK without Internet

DPDK can be installed and configured without an internet connection.

1. Log into the Platform Setup Application page:
  - a. Select **Capture Settings**.
  - b. Check the box in Monitoring column against each sniffing interface that you want to use for capturing the traffic.
2. Log into the machine that hosts the probe or mediation engine and probe as a root user.
3. (Optional) For better understanding of the network, CPU, and NUMA nodes of the server, run the `system_layout.py` script to display system information.

```
source /opt/oracle/ocsm/ocsm_env.sh
/opt/oracle/ocsm/usr/share/pld/rat/system_layout.py
```

4. Run the following command:

```
yum install kernel-uek-devel-$(uname -r)
```

5. Download the DPDK tar file from <http://git.dpdk.org/dpdk/refs/> into the folder `/var/cache/ocsm/dpdk/`.

6. Run the following commands as a root user:

```
source /opt/oracle/ocsm/ocsm_env.sh
/opt/oracle/ocsm/usr/share/pld/rat/configure_dpdk.py
```

7. (Optional) To view all the available advanced options, run the following command:

```
/opt/oracle/ocsm/usr/share/pld/rat/configure_dpdk.py -h
```

8. Reboot the machine that hosts the probe or mediation engine and probe.

## Updating DPDK

This section provides the instructions to update DPDK after a Kernel update.



**Note:**

You must perform the instructions in this section if you have installed another Linux Kernel.

To update DPDK:

1. Reboot the system.
2. Follow the procedure detailed in [Installing and Configuring DPDK with Internet](#) or [Installing and Configuring DPDK without Internet](#) depending on your setup.
3. Reboot the machine that hosts the probe or mediation engine and probe.

## Uninstalling DPDK

This section describes the instructions for uninstalling DPDK.

To uninstall DPDK:

1. Run the following commands:

```
source /opt/oracle/ocsm/ocsm_env.sh/opt/oracle/ocsm/usr/
share/pld/rat/configure_dpdk.py --remove
```

2. Reboot the machine that hosts the probe or mediation engine and probe.

# 6

## Installing Skype for Business Agent

This chapter explains how to install the Skype for Business Agent for Oracle Communications Enterprise Operations Monitor, and Oracle Communications Operations Monitor.

### Overview

For Enterprise Operations Monitor (EOM) to monitor Skype for Business encrypted SIP messages, the user must install a Windows service (Agent) on the Skype for Business server. The Skype for Business Agent registers itself on the server and acts as a back-to-back user agent for the Skype for Business calls, obtaining access to the SIP message bodies. It then forwards the SIP messages to the EOM Mediation Engine, which analyzes them and displays them in the calls list alongside regular VoIP calls.

The Skype for Business Agent is distributed as a regular Windows .msi package which offers a wizard based installation.

### Pre-requisites

Before installing Skype for Business Agent, ensure that you have the following:

- Mediation Engine is installed on Linux and the Skype for Business Server machine is able to connect to the Mediation Engine.

## Installing Skype for Business Agent

To install Skype for Business Agent:

1. Download the Skype for Business installation file to a temporary directory (*temp\_dir*).
2. Go to the *temp\_dir* directory.
3. Unpack the **Skype for Business to Skype Agent** for Business (SFB) server.
4. Run the **Skype for Business Agent** file.

The Oracle EOM Skype for Business Agent Setup wizard appears.

5. Click **Next**. The End-User License Agreement screen appears.
6. Accept the license agreement and click **Next**.

The ME Connection Settings screen appears.

7. In the **ME Host Address** field, enter host address.
8. It is recommended not to deselect **Use TLS**. When selected, the connection to Mediation Engine is encrypted.



 **Note:**

If encryption is selected, you must generate a TLS certificate for the Skype for Business Agent which includes a Certificate. Upload the TLS certificate to the Enterprise Operations Monitor machine, and install it on the Skype Server in the local computer Trusted Certification Authorities store, and install the generated certificate including the private key permissions in the Personal Certificate store.

 **Note:**

**Important:**

- Grant the read permissions for the private key to the OracleSkypeProbeUser account.
- If encryption is not selected, the user must also select the Allow insecure connection checkbox in the Trusted certificates section in the Enterprise Operations Monitor setup.

The Ready to Install Oracle EOM Skype Agent screen appears.

9. Click **Install**.

The installation sets up a service on the windows server and creates an user account, **OracleSkypeProbeUser** for the service.

10. Click **Finish**.

The Skype for Business Agent installation is now complete and the calls made from Skype will appears as a Skype call in the call details window.

## Uninstalling Skype for Business Agent

To uninstall Skype for Business Agent:

1. From your machine, click **Start** and then click **Control Panel**.
2. Click **Programs**.
3. Click **Program and Features**.
4. In the list of currently installed programs, select **Oracle EOM Skype for Business Agent** and then click **Uninstall/Change**.
5. A confirmation dialogue box appears. Confirm Uninstallation.

The Skype for Business Agent is uninstalled.

## Editing ME Host Address

To edit the ME host address:

1. Open the configuration file, **C:\Program Files\Oracle\Oracle EOM> Skype Probe \SkypeProbe.exe.config**.
2. Change the value of the tag having key, **apidAddr**. For example,

For example:

```
<add key="apidAddr" value="192.168.123.120"/>
```

3. Save the **SkypeProbe.exe.config** file.
4. Place the cursor on the **Oracle EOM Skype Probe** service name and right click to restart.

## Configuring Skype for Business Agent for Monitoring Call Quality Information

The Skype for Business Agent monitors only the SIP call flow. The call quality information is reported by the user agent, Skype for Business Desktop Client.

To get the call quality information:

1. Enable monitoring on the Skype server.

See <https://docs.microsoft.com/en-us/skypeforbusiness/deploy/deploy-monitoring/deploy-monitoring>.

2. Install and configure the Skype for Business SDN API on the Skype Front-End Server, as described in the Skype for Business SDN API 2.4.1 Installation Admin Guide.

See <https://docs.microsoft.com/en-us/skype-sdk/sdn/articles/installing-sdn-interface>.

3. After the installation, add the Mediation Engine machine to Skype for Business Server as a subscriber for the SDN API by running the following command in the Skype for Business Server console:

```
SDNManager.exe /p s EOM submituri=https://<IP_address>/sfb/
```

where *<IP\_address>* is the IP address or the hostname of your Mediation Engine.

The finished Skype calls show the MOS values and media summary.

4. Configure the SDN Manager to send QualityUpdate messages to the Mediation Engine by running the following command:

```
SDNManager.exe /p s EOM "quality=True"
```

5. Operations Monitor reads the SDN Interface messages from the URL <https://<Mediation Engine Host>/sfb/>.

```
cd "C:\Program Files\Microsoft Skype for Business Server
\Microsoft Skype for Business SDN Manager\" SDNManager.exe /
parameter subscriber ocom "submituri=https://<MediationEngine
Host>/sfb/"
```

6. After configuring the SDN Dialog Listener and SDN Manager, run the following command for SDN Manager to forward the messages to Operations Monitor:

```
cd "C:\Program Files\Microsoft Skype for Business Server\Microsoft Skype for
Business SDN Manager\"
SDNManager.exe /parameter subscriber ocom "submituri=https://
<MediationEngineHost>/sfb/"
```

7. Verify the SDN Manager configuration:

```
cd "C:\Program Files\Microsoft Skype for Business Server\Microsoft Skype for
Business SDN Manager\"
SDNManager.exe /download subscriber
```

You should get an XML describing the configuration.

 **Note:**

Make sure the value of the `submituri` parameter matches the address of the Enterprise Operations Monitor machine.

8. Check the SDN Manager and Dialog Listener log files at `%LOCALAPPDATA%\Local\Temp\SDN` after each Skype for Business call. Open the `SDNManager.log` file and search for the following:

```
Starting to transmit the message?
```

If the line does not exist, the SDN manager is configured incorrectly. Repeat the configuration process again.

## Troubleshooting

This section provides guidelines for troubleshooting problems with Skype for Business Agent.

### Problems with Viewing Skype Call Data Information

Perform the following if you are unable to view skype call data:

1. Verify that the **SkypeProbe.exe.config** file located in the installation directory has the correct IP address of Mediation Engine.
2. Verify Mediation Engine machine is reachable by pinging the Mediation Engine Machine from Skype for Business Server.
3. Verify the logs for any exceptions or connection errors in the following path:  
**C:\ProgramData\Oracle EOM Skype Probe\Logs**
4. Ensure that **OracleSkypeProbeUser** is a member of RTC Server Applications local group. If not, add the user by doing the following:
  - a. From your computer, click **Start** and search for **Computer Management**.
  - b. Click **Computer Management**.  
The Computer Management screen appears.
  - c. Click **Local Users and Groups**.
  - d. Select and right-click the **RTC Server Applications** group and click **Add to Group**.
  - e. Locate and add the **OracleSkypeProbeUser** and click **OK**.  
The **OracleSkypeProbeUser** will be added to the RTC Server Applications group.
5. Verify the Enterprise Operations Monitor Skype for Business agent service is running in `services.msc`. by doing the following:
  - a. From your computer, click **Start** and search for **Computer Management**.
  - b. Click **Computer Management**.  
The Computer Management screen appears.
  - c. Click **Services and Applications**.

- d. Click **Services**.
- e. Verify if Skype for Business Agent service is running, if not, right-click the service and click **Start**.

The Skype for Business Agent will start running.

- 6. Verify if the connection between Mediation Engine and Skype for Business Server is blocked by firewall. If blocked, disable the setting depending on your Operating System.
- 7. If you have selected **Accept insecure connections from remote probes** during Enterprise Operations Setup, set the **UseTls** parameter to false in the **SkypeProbe.exe.config** file.